APPENDIX A

OPINION

District Court, E.D. Michigan, S. Div.)

(Dollar Electric Company v. Syndevco, Inc, et al. Nos. 7-70057 and 8-71705.)

Decided Sept. 10, 1979)

Plaintiff, Dollar Electric Company, owns U.S. Patent No. 3,281,747 (hereafter patents will be referred to by their last three digits), issued October 25, 1966 to Amos Winsand, one of the stockholders of Dollar. Defendant Syndevco, Inc. is an automotive supplier located in Southfield, Michigan which supplies and holds Ford harmless with respect to a device alleged to infringe the '747 patent. Jurisdiction exists under 28 U.S.C. § 1338; defendants concede proper venue and a trial by jury was waived. What follows constitute my findings of fact and conclusions of law.

I. Background Facts

The patent in suit is for a device to change the output voltages from a transformer. Such a device may have many uses, but the one most pertinent to this case is in the field of resistance welding.

Resistance welding consists of fusing two sheets of metal by simultaneously pinching them together between two copper electrodes and passing a large electric current through the pinch-point. The resistance of the metal to the current generates heat which accomplishes the weld. The currents used are in the neighborhood of 15,000 to 40,000 amperes, carried at four to seven volts.

High amperage, low voltage currents are not available through public utilities because current transmission at such low voltages is inefficient. Thus, to perform resistance welding the manufacturer must "transform" the 440 volt, 150 ampere current which is available. This is done with a transformer. A transformer operates on principles of electrical induction, according to Maxwell's equations. It consists of a pair of coiled conductors placed adjacent to one another. Current passing through the "primary" "induces" a current into the "secondary" coil. The relationship of input to output current varies depending on, inter alia, the ratio of primary to secondary "turns" in the coils. By changing the turn ratio, the output voltage can be changed. This is the genesis of the instant patent.

One transformer will produce different outputs if the primary is "tapped," that is, if instead of passing through the entire primary, current passes through only part of it. This varies the effective turn ratio. Connections to the primary to enable this to occur are "taps." A tapped transformer can produce several outputs by a switch of the tap connection.

Resistance welding transformers are commonly of the "package" variety; the two coils are imbedded in an epoxy compound which is, in turn, encased in a sturdy metal housing. Often water from an external source circulates through the transformer housing to cool it. Resistance welding transformers generate substantial quantities of heat when in operation.

One transformer can produce the current necessary to supply one set of electrodes. The combination of a transformer and a pair of electrodes is called a "welding gun." Welding guns may be mounted side by side on racks to produce a series of closely spaced spot welds.

The closeness of the welds depends mainly on the width of the transformers, which may vary between 4 and 9 inches.

For maximum utility, a package transformer is tapped and possessed of some means to change the tap settings. This is required because different types of metal bond better with varying amounts of heat generated by different currents.

Prior to the early 1960's, tap settings were changed by means of a "tap switch." This is a rotary device that changes the tap setting by rotating a current carrying voltage source lead into contact with one of several tap terminals arranged in a semi-circular array around the axis of the tap rotor. Early tap switches were unreliable because the voltage carrying conductor could be inadvertently positioned between tap terminals, causing a short. Moreover, the inadvertent changing of the tap setting presented problems. This was cured by the invention of a snap-locking mechanism that made it very difficult to mis-position the tap switch or unknowingly change its setting. Plaintiff's Trial Exhibit 2 ("PTX 2") (Stevens patent '520)

At about the same time the Stevens device came into use, another advance occurred: the quick disconnect primary plug, Girton Reissue patent '838. PTX 124A. Prior to the disconnect plug, the transformer was "hard-wired" to the voltage source. When the transformer failed, it took considerable time to disconnect it and install a new one. This "down time" cost manufacturers time and money. The Girton device allowed a failed transformer to be quickly replaced. In 1957, Girton combined the ideas of a tap switch and a disconnect plug and received U.S. Patent '431. PTX 154.

Completing this discussion, a word should be said about the environment resistance welding transformers must withstand. It is very dirty. This is due to the spark splatter that is produced every time a weld is made, PTX 5, and to the dirt and grease present around any heavy machinery. Another problem is water leakage from the cooling systems. Finally, there is a danger to workers if the "live" tap terminals or voltage source leads are exposed to contact. These factors make it imperative that the tap switch mechanism be totally enclosed. This feature is shown by Girton '431 which discloses a sealed enclosure for the tap switch.

In the late 1950's the automobile industry began to use galvanized metal in automobile bodies. Galvanized metal requires more current to weld than ungalvanized metal. Such necessary large currents when transmitted at low voltages cause power loss. The previously mild problem of power loss between the transformer and the electrodes thus became more acute. Accordingly, there was a need for a more powerful transformer that could be positioned closer to the welding electrodes. This mandated more efficient, compact construction of transformers. One component of the desire for compactness was the desire for a narrow transformer.[1]

In early 1962, Herman Klingelhofer of the Fisher Body Division of General Motors asked Amos Winsand if he could develop a transformer to meet these dual needs of a narrow transformer whose tap setting could be changed. The chronology of Winsand's solution will be detailed later. The "multi-tap plug" Winsand developed and patented provided a solution to this problem.

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[1] In addition to the drive for compactness, there was a lesser need for a more reliable, inexpensive construction for the tap switch. This was part of the motivation for the Winsand patent. The interaction of this need with the need for a narrow transformer has created some difficulty in analyzing the instant lawsuit. For now it is only important to note the parallel needs that existed.

II. The Winsand Device

Winsand '747 is, basically, a combination of a transformer with a quick disconnect plug that has been modified to perform the function of the tap switch. Its design enables the construction of a narrow transformer with an adjustable output voltage.

The Patent Office after considerable file activity allowed Winsand five claims.[2] The claims describe two embodiments of the combined tap switch quick disconnect plug. Claim 1 sets forth the essence of the invention. It recites nine basic elements. They are listed here. See Trial Transcript at 342-351. ("TT")

(1) A transformer having a primary and a secondary

(2) A plurality of taps connected at spaced points to the primary

(3) The taps are connected to tap terminals, which are insulated from one another

(4) A primary disconnect plug with a pair of spaced female terminal receptacles connected to a voltage source

(5) The tap terminals are arranged so that there are two or more pairs created, the pairs being spaced apart the same distance as the plug receptacles

(6) Neither terminal of the first pair of terminals is a member of another pair

(7) A plug that can be connected to energize the primary by fitting into removable contact with the terminals

(8) The pairs of tap terminals are spaced so that the plug can bridge various pairs of them

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[2] They are set forth in full in Appendix "A".

(9) The primary disconnect plug functions as a tap switch

Claims 2 and 4 more specifically describe a circular version of the Claim 1 device, without specifically referring to Claim 1. In Claim 2, it is specified that the pairs of tap terminals called for by (5) above be achieved by placing one common tap terminal in the center of a circular array of other tap terminals. Thus, by rotating a plug around the center tap, various pairs are produced, with various corresponding output voltages. This, of course, does not meet the requirement (6) in Claim 1 that "neither terminal of said first pair of terminals is a member of another pair;" the center tap terminal is common to every pair.

Claim 4 essentially repeats Claim 2 but recites the addition of a housing surrounding the tap terminals, with an opening through which the primary plug passes. The plug is fitted with a cover plate which, after the plug is engaged, may be fastened to the housing, totally enclosing the terminal assembly. Claim 4 is represented pictorially by PTX 19, Appendix "B." (The labels are mine)

Claim 3 is simply another arrangement of the tap terminals. There are six terminals, arranged in three horizontal rows of two each. The top and bottom rows are individual tap terminals, connected at varying points electrically to the primary coil. The two middle terminals are shorted together and are both connected to the opposite end of the primary from the four taps already described. By positioning the plug across the four pairs of terminals formed by the top and bottom rows, four output voltages may be obtained.

Claim 5 recites Claim 3 with the addition of a housing surrounding the terminals and a cover plate behind the

plug. With the addition of a gasket, the cover plate completely seals the terminal and plug construction from the outside. Claim 5 is depicted pictorially in PTX 17, Appendix "C." (Again, the labels are mine)

Winsand claims that the Syndevco device infringes all five claims.[3] His expert witness, Townsend Beaman, said he was inclined to rely most heavily on Claims 4 and 5, however.

Defendants raise a host of defenses, arguing all the claims of the patent are not valid and that even if they are, the Syndevco plug and tap switch does not infringe any of them. More specifically, Defendants contend as follows:

(1) Claim 1 is invalid under 35 U.S.C. § 112 because it fails accurately to describe either embodiment of the Winsand invention as described in the specification;

(2) Claim 1 is invalid for overclaiming the invention;

(3) Claims 1 and 2 are invalid under 35 U.S.C. § 102(g);

(4) Claim 2 is invalid under 35 U.S.C. § 102(a);

(5) All of the claims are invalid under 35 U.S.C. § 103.

With respect to Claim 1, Defendants say that neither embodiment meets all the requirements of Claim 1. The rectangular embodiment does not have "a plurality of taps . . . said tap respectively having spaced tap

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[3] Throughout the trial, Plaintiff has failed to distinguish between the different claims resulting in some confusion in the evidence and briefs. In this opinion I will treat the claims separately except where reference to "the Winsand device" as a whole will not be imprecise in any material fashion.

terminals *insulated from one another.*" (emphasis supplied) The two middle terminals are not insulated from each other. Thus, Defendants argue that the claim fails to particularly point out and distinctly claim the subject matter of the invention. 35 U.S.C. § 112 This contention is rejected.

First, though the language cited from the claim could have been more precise, it is susceptible of interpretation in harmony with the rectangular embodiment. The "insulated from one another" requirement can reasonably be read to mean only that the *pairs of terminals* are insulated from one another, not that *all* of the terminals be insulated from *all* others. There is testimony on the record to support the reasonableness of this reading. Moreover, it is in harmony with the policy to read claims in conjunction with the specification. The specification of the rectangular embodiment shows clearly that the two center tap terminals are connected but that the terminals in the top and bottom rows are insulated from any other terminal. See Fig. 8 of Winsand '747. Application of Cormany, 476 F2d 998, 1001, 177 USPQ 450, 452-453 (CCPA 1973) Interpreting the instant claim in light of the purpose the invention is to accomplish, it is evident that the challenged defect in the language is more like a clerical error than a substantial element of the invention. Autogiro Co. of America v United States, 384 F2d 391, 155 USPQ 697 (Ct. Cl. 1967).

The fact that the limitation as to the taps being respectively insulated from one another was inserted to distinguish it from Maberry "559 does not change this result. The feature in Maberry sought to be avoided was the fact that there, in each position of the plug, two electrically connected terminals were active. In Winsand

it was sought to show that the working terminals in any given pair were always insulated. TT 211-213.

[1] As to the assertion that the specification fails to support the "insulated from one another" feature, this too is rejected. As noted, Fig. 8 shows that the two center terminals are connected electrically. Moreover, in Column 3, Lines 29-34, the specification explains that both center tap terminals, 142 and 143, are secured to tap 124, which clearly shows that they are not insulated from one another as the claim mistakenly recites. The purpose of the requirement that the claim be supported by the specification is to put the public on notice as to the limits of the claim. I find that no one of ordinary skill in the art would be confused as to the scope of the patent by the ambiguity in the claim. Kaiser Industries Corp. *v* McLouth Steel, Corp., 257 F Supp 372, 428, 150 USPQ 239, 283-284 (E.D. Mich), aff'd 400 F2d 36, 158 USPQ 565 (6th Cir. 1966), cert. denied 393 U.S. 1119, 160 USPQ 832 (1969). One would see that the terminals need only be insulated as between those forming operative pairs.

Defendants also say that the requirement in Claim 1 that "neither terminal of said first pair" of terminals be a terminal of any other pair is not met by the round embodiment. This is true because in the round version, the center terminal is common to all pairs. However, in the course of the trial, Plaintiff's witnesses said that this language had little significance and that Claim 1 meant the same thing with the language or without it. TT 237. Defendants urge that the language is immaterial in claiming that Bauer '072 anticipates Claim 1 and in urging that it is an obvious variation on Owen '260. Thus, the parties seem to argue that the language is not important. It would be illogical to allow Defendants to exalt this phrase to invalidate Claim 1 under § 112, but

minimize its importance in showing invalidity under § 103.

Defendants next urge Claim 1 is void for "overclaiming" the invention. This contention is, essentially, that even if the plug-tap switch itself is patentable, Claim 1 recites as elements of the invention many old and unpatentable devices, such as a transformer, taps and a primary disconnect plug. I find this claim persuasive and thus invalidate Claim 1. Without extended discussion, it is evident that the words of Judge McAllister are pertinent here.

> [W]e are of the opinion that the claims of the patent in suit *are invalid* for the reason that the patentees do not particularly point out and distinctly claim the part, improvement, or combination which they claim as their invention or discovery, as required by the controlling statute . . ." Patrol Valve Co. v Robertshaw-Fulton Controls Co., 210 F2d 146, at 150, 100 USPQ 239, at 242 (6th Cir. 1954), cited in Holtensson v V-M Corporation, 325 F2d 109, 124, 139 USPQ 401, 412-413 (6th Cir. 1963), cert. denied 377 U.S. 966, 141 USPQ 950 (1964).

The language in Claim 1 gives no indication as to what is claimed, among all of the old elements, to be new. I would not be inclined to so hold except for the fact that during the trial of this case, in argument and in testimony, Plaintiff consistently referred to and regarded his invention as a *patented transformer*, not simply a multi-tap disconnect plug. Defendants have not asserted overclaiming as a defense to any other claim. Perhaps this is because the modifications to the transformer housing contemplated thereby or the more specific tap terminal arrangements more specifically disclose the

invention. In any event, I have no need to pass on the applicability of this defense to the other claims.

Having voided Claim 1 on overclaiming grounds, it is still advisable to discuss it in connection with the obviousness defense which, raised as to all claims, formed the vast bulk of the proofs put forth at trial.

III. The Graham v. Deere Inquiries

[2] To be patentable an invention must be useful, novel, and meet the nonobviousness test of 35 U.S.C. § 103:

> A patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior act are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains . . .

In Graham v John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966), the Supreme Court held that in applying the nonobviousness condition on patentability, the courts must make three basic formal inquiries: (1) the scope and content of the prior act; (2) the differences between the prior art and the claims at issue; (3) the level of ordinary skill in the pertinent art.

A. The Scope and Content of Prior Art

1. The "Art" to Which Winsand '747 Pertains

[3] Under Graham, the trial court must determine: (1) the art to which the patent in suit pertains, and (2) its content. The parties have not emphasized the dual nature of this inquiry, but the distinction is important.

See, e.g., 2 D. Chisum Patents, § 5.03[1] (1979) (hereafter "— Chisum at — ")

Plaintiff maintains his patent is limited to the "resistance welding art," being another in a series of small but discrete steps following the invention by Taylor of small package transformer welding guns in 1958. Plaintiffs seeks, by this limitation, to narrow the scope of the pertinent prior art and avoid the impact those references would have upon the obviousness determination. I find that the references sought to be avoided would not be avoided by limiting the pertinent art as Plaintiff contends. However, by denying the limitation, that conclusion is superfluous.

[4, 5] The pertinent art should not always be defined by reference to the group which will use the purported invention. It should be defined by reference to the group possessing the skills to solve the sort of problems which confronted the inventor. See, e.g. Kitch, Graham v John Deere Co.: New Standards for Patents, 1966 Sup Ct Rev 336.8 (1966). In this case, the relevant art is the electrical arts in general, with emphasis on means of voltage transformation and multiple circuit reconnections. Obviously, no specific academic or occupational discipline functions solely in this area, these skills being nearly universal among those skilled in a host of fields, yet it is as near as I can come to a definition that will adopt what Kitch calls the "problem-solving" approach as opposed to the "product-function" approach urged by Plaintiff. 2 Chisum at § 5.03[1]

[6] My definition of the pertinent art requires a high amount of cross-disciplinary insight on the part of putative inventors. This is appropriate for at least two reasons. First, as technology burgeons "it is simply evenhanded application to require that those persons

granted the benefit of a patent monopoly be charged with an awareness of "the advances made in other fields. Graham, 383 U.S. at 19, 148 USPQ at 467. Second, the principles involved in the Winsand invention are elemental. They are used in a host of areas. They transcend narrowly proscribed industrial classifications that bear no relation to the policies behind the patent law. In his deposition Plaintiff himself admitted that in making his invention, he should have looked to other areas which had addressed similar problems, but did not. Winsand Deposition at 94. He also conceded the applicability of his invention to other areas.

The cases support the "problem-solving" approach. 2 Chisum at § 5.03[1]; Janex Corporation v Bradley Time, 460 F Supp 383, 388, 199 USPQ 525, 529-530 (S.D. N.Y. 1978). For example, in Calmar[4] the Supreme Court adopted it by characterizing the problem facing the inventor as one of "mechanical closure" rather than of "insecticide" as the inventor urged. 383 U.S. at 35 A more enlightening example is Metaframe Corporation v Biozonics Corporation, 352 F Supp 1006, 1012-1013, 176 USPQ 237, 241-242 (D. Mass. 1972) There the court held invalid a patent which consisted of a power transfer from a [*sic*] electric motor to a plastic impeller blade by means of two doughnut shaped magnets, which were separated by a layer of plastic to keep water from the motor. The plaintiff applied this principle of power transfer to an aquarium filter, claiming the aquarium field was the relevant art. The court disagreed, stating that the obviousness test should be applied to "persons having ordinary skill in the basic mechancial or scientific field,

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[4] Calmar, Inc. v. Cook Chemical Co., a companion case to Graham, reported at 383 U.S. 1, 148 USPQ 459 (1966).

such as fluid dynamics," even though people with such skills might not ordinarily be called upon to exercise them in the aquarium field. The analogy to this case is clear: people in the resistance welding area might not ordinarily be called upon to exercise their knowledge of the fundamental mechanical and electrical principles involved in a multi-tap plug, but do possess them. Plaintiff's error is in characterizing the essential problem confronted by Winsand as one *peculiar* to resistance welding rather than to a wide range of disciplines. Just as the problem in In re Application of Grout, 377 F2d 1019, 1022, 153 USPQ 742, 744-745 (C.C.P.A. 1967) called for the "talents of one skilled in the art of fasteners" even though the problem solved "would be encountered by a beekeeper," the problem confronting Winsand called for the talents of one skilled in voltage transformations and means to change circuits, rather than the skills of one accustomed to solving only resistance welding problems. See, e.g. Systmatic Tool, etc. v. Walter Kidde & Co., Inc., 555 F2d 342, 349, 193 USPQ 587, 593 (3d Cir.), cert. denied 434 U.S. 857, 195 USPQ 466 (1977).[5]

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[5] My holding in this regard might be clarified by observing that Plaintiff's error is not so much that he uses the "user" rather than the "problem solver" in resistance welding as the reference point, but that he uses a "resistance welding problem solver" rather than an "electrically skilled" or "voltage transformations" problem solver. Although the talents of the former are most likely to encounter *this* problem, this likelihood is more a fortuitous circumstance than a cross-disciplinary rigidity that the patent law should encourage. The benefits of bending to accommodate industrial reality are sometimes subordinate to the countervailing policy of encouraging cross-disciplinary awareness.

2. The Content of the Pertinent Prior Act

[7] The second portion of the initial Graham inquiry is to ascertain the *content* of the prior art. The task is to ascertain the teachings of prior patents and other references described in 35 U.S.C. § 102 in the art to which the patent in suit pertains at the time of the invention. Ordinarily, this is accomplished by evaluating prior references in the art in question and references in such closely related fields "as a person with ordinary skill in the art would be expected to examine for a solution to the problem." 2 Chisum at § 5.03[1] These closely related fields are called "analagous arts." By defining the pertinent art as I have, the problem of determining analogous arts has been largely obviated; my definition of the pertinent art encompasses all the references upon which the Defendants rely for their defense of obviousness, i.e., the patents cited by Defendants in ¶8 of the Final Joint Pre-Trial Statement.[6]

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[6] In the alternative, I find that the content of the prior art for the patent in suit would be the same even if I adopted Plaintiff's definition of the relevant art as "resistance welding." This is because under the prevailing definition, all of the references cited by defendants would be from analogous arts. An ordinarily skilled resistance welding designer would or should examine other fields such as electrical connectors (Cage '492), electric circuit controls (Owen '260), and motor connectors (Shere '578) in seeking a solution to a problem involving producing different secondary voltages from a constant primary voltage. See, Winsand Deposition at 94. Recent cases from this circuit support this conclusion. The Sixth Circuit takes a fairly broad view of what constitutes analogous art. See, e.g. Tapco Products Co. v. Van Mark Prods. Corp., 446 F.2d 420, 427, 170 USPQ 550, 555 (6th Cir.), cert denied 404 U.S. 986, 172 USPQ 1 (1971); Skega Aktiebolag v. F. Goodrich Co., 420 F.2d 1358, 164 USPQ 333 (6th Cir.), cert. denied 400 U.S. 825, 167 USPQ 257 (1970); Buffalo-Springfield Roller Co. v. Galion Iron Works Mfg. Co., 215 F.2d 686, 103 USPQ 72 (6th Cir. 1954). See also Automatic Arc Welding Co. v. A. O. Smith Corp., 60 F.2d 740, 14 USPQ 127 (7th Cir. 1932); Dann v. Johnston, 425 U.S. 219, 189 USPQ 257 (1976).

One final issue concerning the content of the prior art pertains to the § 102(g) defense raised as to Claims 1 and 2. Section 102(g) provides:

> [A person shall be entitled to a patent unless — . . .] (g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned . . . it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other.

[8] Under this section, an invention which is conceived prior to the patentee's conception but is not reduced to practice until after the patentee reduces his invention to practice may completely invalidate patentee's invention or be a part of the prior art considered in the obviousness inquiry if, after conception, due diligence in reducing the prior invention to practice was exercised by the prior inventor.[7] Defendants claim that William Emaus and Deitrich Roth, among others, at Kirkhof Manufacturing Co. invented Winsand's device (or at least Claims 1 and 2) before he did. For reasons that follow, this contention is rejected.

The chronology of developments at Kirkhof upon which Defendants rely may be summarized as follows: In

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[7] See, e.g., 2 Chisum at § 5.03[3][c]: "Prior invention should constitute prior art as of the date of invention except where the prior inventor is found to have abandoned, concealed or suppressed the invention."

1960, William Emaus was the manager of the transformer division at Kirkhof. Toward the end of 1960 he hit upon the notion that the disconnect plug used by Girton '431 might be modified to perform the function of the tap terminals. Although this may have been suggested by Karl Sarafian, a production engineer and development liason at Fisher Body Division of General Motors, Emaus claims the idea as his own. The virtues of such an arrangment were explained by Sarafian to be the elimination of moving parts from the tap switch mechanism and an increased reliability that would result.

On December 28, 1960 Emaus wrote Sarafian a letter stating that he would explore the feasibility of such a device. Defendants' Deposition Exhibit ("DDX") LL.

More or less contemporaneous with the auto industry's desire for a combination tap switch and disconnect plug, there was also a growing desire for smaller transformers able to perform the same work as the larger ones then in use. This, in turn, generated a need for voltage selecting devices smaller than the tap switches then available. Of this, more will be said later.

Emaus' idea for a combination disconnect plug and tap switch was described in DDX HH. It is virtually identical to Winsand's invention as set forth in Claims 1 and 2 and according to the testimony of Emaus, it reads directly on those claims. However, no contemporaneous drawing or model could be produced. Indeed, development of the idea seems to have lapsed entirely until early 1962 when Emaus said a prototype of the HH device was built. The time of the building of HH could not be placed with any accuracy, nor could it be produced.

The next piece of concrete evidence is DDX UU3-A, a page from Sarafian's log book dated June 11, 1962 which refers to a narrow transformer — about 4" — with a combination plug and tap switch. Sarafian was unable to recall its design, but it appears to have corresponded to a later development represented by the drawing that is DDX AA. The trial of the UU3A device disappears for a time after the June 11 entry.

Meanwhile, development of the HH idea was proceeding, albeit slowly. Sometime in the spring of 1962, probably in June, Emaus gave instructions to Deitrich Roth, Kirkhof designer, to make a drawing of the HH device, elaborating on some of the features present in the HH prototype. This drawing was completed on July 30, 1962. DDXX. After its completion, Roth spent several months with a detailer, Hildegard Babson, preparing a series of detailed drawings of the X device, DDX Z-1-Z-15. These were completed in late September of 1962. After their completion, the X project was "shelved," in Roth's words. He believed that the X idea was simply not an improvement over Girton '431. Although a prototype of X was constructed, it was never tested and never put into production.

Early in 1963, the desire for a narrow transformer reasserted itself, after apparently having lain idle since June 11, 1962. Emaus asked Roth to design what I have called the AA device. It consists of a plug and tap switch combination in which there are four pairs of tap terminals arranged in a vertical linear array which are spanned by a disconnect plug used to change the tap setting. The AA device, as described, reads word for word on claim one of Winsand, except that electrically speaking, it does not meet what all agree is the fairly insignificant limitation of neither terminal of the first

pair being a member of the second or subsequent pairs. Emaus appears to have instructed Roth to begin work on the drawing about January 10, 1963, as the drawing was completed on February 25. DDX AA.

The AA device was first produced in prototype form and shortly thereafter a number of production transformers incoporating it were sold to Fisher Body. The in-line arrangement of tap terminals never gained commercial acceptance. Fisher Body felt that the cover plate behind the plug, being a loose part, presented problems from a maintenance standpoint.

In response to the failure of the AA device, Kikhof rearranged the tap terminals so that the pairs were formed not by bridging two straight lines of terminals, but by spanning the diameter of a circle. By September, transformers incorporating the round plug-tap switch were sold successfully to Fisher. See DDX CC, DD, EE and FF.

Meanwhile at Dollar, the following events transpired: In March or April of 1962, Herman Klingelhofer, a Fisher Body production engineer whose duties roughly paralleled those of Sarafian, called on Winsand at Dollar. He requested that Dollar try to develop a narrow transformer was made [*sic*] develop a narrow transformer that could produce several output voltages. A narrow transformer was made easily. The variable output feature proved more troublesome due to the unavailability of narrow tap switches. Soon, Winsand "struck upon the idea of using the plug with the various groups of terminals in adjusting the secondary voltage." T.T. 68. Working in his shop he fashioned a prototype of the device described in Claim 5 of his patent (narrow rectangular plug and tap switch combination). It is not clear just when this occurred; it is only known that it was

after late March but before June 18 when Winsand made a drawing, PTX 26, showing the device in detail.

Shortly thereafter, on July 31, 1962, Winsand drew PTX 31, a full-scale rendering of the circular device described in Claim 4.

By early July the rectangular device had been tested and very soon thereafter several were sold and shipped to Fisher Body's Marion, Indiana facility. Ford was buying it within a few months. PTX 38-42.

In sum, Kirkhof was first with the basic idea of using a disconnect plug for a tap switch. However, development and refinment of the idea lagged for well over a year until early 1962, at roughly the same time Winsand began to work on Klingelhofer's request. Whereas the idea for the combination of plug and tap switch and the narrow arrangement of the tap terminals occurred nearly simultaneously to Winsand, the two ideas emerged separately to Kirkhof.

Defendants argue that the developments at Kirkhof between 1960 and 1963 invalidates Claim 1 of Winsand under 35 U.S.C. § 102(g).

[9] To establish prior invention by a third party to invalidate a claim, the defendant must show the third party conceived the idea before the patentee and thereafter diligently worked to reduce it to practice, even though the patentee may have been the first to actually reduce the invention to practice.

[10] A good definition of conception is found in 1 Walker of Patents § 45 (2d Deller ed. 1964):

> The date of conception is the date when the inventive idea is crystalized in all of its essential attributes and becomes so clearly defined in the

> mind of the inventor as to be capable of being converted to reality and reduced to practice by the inventor or by one skilled in the art. It is settled both by practice and by case law that such exterior expression of the mind of the inventor when relating to machines and structural embodiments may be by physical exhibits either in the form of drawings or of models. In this manner, the inventor may lay the foundation of a claim to priority, provided the invention be made sufficiently plain to enable those skilled in the art to understand it, to construct it, and to operate or use it.

The conception at Kirkhof cannot accurately be placed much before DDX X, July 30, 1962. Emaus testified he had the "idea" in December of 1960. However, other than the DDX LL letter, no corroboration could be produced until much later, sometime in 1962; no prototype of either HH or X could be found.

[11] On matters of invalidity, the defendant bears the burden of proof and the risk of non-persuasion. 35 U.S.C. § 282; Schnadig Corp. v Gaines Mfg. Co., Inc., 494 F2d 383, 390, 181 USPQ 417, 421-422 (6th Cir. 1974); Westwood Chemical Inc. v Owens-Corning Fiberglass Co., 445 F2d 911, 914, 171 USPQ 1, 3-4 (6th Cir. 1971), cert. denied 405 U.S. 917, 172 USPQ 577 (1972). The evidence simply does not show Emaus "conceiving" his idea before Winsand did sometime in the period March-June 1962.

It is certainly *possible* that Emaus' conception occurred as early as 1960. He testified that even at that early date he "knew it would work." Yet in many respects, Emaus' testimony was vague. At one point he put his idea firmly in 1960 or 1961, yet later he said it could have been as

late as 1962. (Emaus Deposition at 13, 35 and 38) This is understandable in light of the nearly 20 years that has since elapsed, but it certainly does not help to place Emaus' conception. It should also be noted that though the instant device is relatively simple, there are certain details in reducing it to practice that prohibit treating the germ of an idea as equivalent to "conception." Thus, I must conclude that at most, Defendants have placed the date of Emaus' conception at a time very near Winsand's. But they have failed to *prove* that Emaus predates Winsand.

[12] I also find that even if Emaus' conception predated Winsand's, he did not use reasonable diligence in reducing his invention to practice. To show invalidity under § 102(g), the purported prior inventor must use reasonable diligence in reducing his invention to practice from a time just prior to the patentee's conception until eventual reduction to practice. If Emaus' conception is placed prior to Winsand's, his diligence becomes increasingly, more difficult to prove. For example, if conception is placed in 1960, the unexplained 15-month delay in making any progress at all on the invention would clearly be fatal to Defendants' claim. If conception is placed sometime in early 1962, the diligence issue is closer, but Defendants still could not prevail. Compared to the alacrity with which Winsand was able to reduce his idea to practice, Kirkhof's efforts appear desultory and half-hearted. For example, between conception in early 1962 and the DDX X drawing, four months elapsed. This is a very long delay in light of the simplicity of the device. And then, after the X drawing was completed, it took another two months to detail it; yet another inexcusable delay. If all of this was not enough, after completion of the Z-series drawing, the whole HH-X project was "shelved." This is an

abandonment of the invention under 35 U.S.C. § 102(g). Finally, any claim based on the efforts directed to the development of the narrow transformer would be unfounded. Nothing at all in that regard can be shown before June 11, 1962, DDX UU-3A, and thereafter, there is a six month delay until any further progress.

Having rejected Defendants' claim that the Kirkhof developments anticipate any claim of Winsand or are part of prior art for § 103 purposes, I turn to an analysis of the references that do constitute prior art.

B. The Differences Between the Best Prior Art and the Winsand Patent

[13] At the outset, I note each claim of a patent is treated as if it was a separate patent. General Motors Corp. v. Swan, 88 F.2d 876, 32 USPQ 475 (6th Cir.), cert. denied 302 U.S. 691, 37 USPQ 842 (1937); Smith Industries Intl. v. Hughes Tool Co., 396 F.2d 735, 736, 158 USPQ 243, 244 (5th Cir 1968); Jack Winter, Inc. v Koratron Co., Inc. 375 F. Supp Supp [*sic*] 1, 19, 191 USPQ 353, 360-361 (N.D. Cal. 1974). Thus, the validity of each of Winsand's five claims should be evaluated independently.

Defendants claim that Bauer's patents anticipate Claims 1 and 2. I agree. The evidence showed clearly that the Bauer patents are identical in all respects to the round version of Winsand as described in Claims 1 and 2. TT 176, 342-352. The only difference is that Bauer transforms varying input voltages into a constant output whereas Winsand delivers varying outputs from a common input. This reversal is obvious; Winsand itself would produce a single output from several inputs, if they were appropriately related. Although there might arise problems with core saturation, Winsand claims

nothing with respect to a core, nor does he mention turn ratios. The essence of Winsand's invention is disclosed in full detail by Bauer. Popeil Brothers, Inc. v. Schick Electric, Inc., 494 F.2d 162, 164-165, 181 USPQ 482, 483-485 (7th Cir. 1974); Duplan Corp v Deering Milliken Research Corp., 487 F.2d 459, 461, 179 USPQ 449, 449-450 (4th Cir. 1973), cert. denied 415 U.S. 978, 181 USPQ 129 (1974); American Seating Co. v National Seating Co., 586 F.2d 611, 617-618, 199 USPQ 257, 261-262 (6th Cir. 1978) cert. denied 47 U.S.L.W. 3683, 202 USPQ 320, 4/17/79; cf. A. J. Industries, Inc. v Dayton Steel Foundry Co., 394 F.2d 357, 359, 157 USPQ 545, 546-547 (6th Cir. 1968). The function of Bauer is to perform a variety of voltage transformations by means of a tapped transformer primary attached to tap terminals arranged in a circle around a center common tap by means of spanning the various pairs of terminals with a power source disconnect plug. Winsand Claim 2 does the exact same thing in reverse. The reverse function is substantially the same as the function itself.

As to the other claims, more extended inquiry is necessary. Note that even if Claims 1 and 2 lack novelty, they would be obvious, as are Claims 3, 4 and 5.

The prior art for the Winsand patent consists of the patents listed in Paragraph 8 of the Final Joint Pre-Trial Statement, the Girton patent '431, and the ultrablitz unit.

[14] The most pertinent prior art is Girton '431 and the Italian and German patents to Bauer. This conclusion means that the Patent Office did not cite the most pertinent prior act. The presumption of validity as to the Winsand patent is diminished, though not greatly, because the best prior art is not greatly more pertinent than the cited prior art. Clark Equipment Co. v. Keller, 570 F.2d 778, 790, 197 USPQ 209, 218-219 (8th Cir) cert.

denied 99 S Ct 96, 200 USPQ 64 (1978); Schandig Corp. v. Gaines Mfg. Co., 494 F.2d 383, 390, 181 USPQ 417, 421-422 (6th Cir. 1974); Tee-Pak, Inc. v. St. Regis Paper Co., 491 F.2d 1193, 1196, 181 USPQ 75, 77-78 (6th Cir. 1974).

At this juncture it would be well to discuss two themes that have recurred throughout this suit. The first concerns the claim that Winsand is limited to resistance welding. It is not. The phrase "resistance welding" does not appear anywhere in the claims and the specification mentions it tangentially, the preamble and in Fig. 2.

Plaintiff took great pains to show resistance welding is a distinct field from transformers in general. It spent much time showing the peculiar problems encountered therein, i.e., dirty environment, inadvertent tap changes, high currents, great heat and stress, the need for a compact and narrow transformer, the problem with down-time. Yet, the claims and specification neglect to mention any of these things. Had Winsand desired to put his transformer in the resistance welding field, it would have been easy to do so. Yet instead of mentioning all of the advantages in that field that he claims to have secured, they are all strangely absent. Compare, Girton '431, page 1, column 1.

[15] The claims of a patent should be read in light of the prior art and the file history to determine fairly the substance of the invention. United States v Adams, 383 U.S. 39, 48-49, 148 USPQ 479, 482-483 (1966). The patent discloses its applicability to resistance welding but, fairly read, the reference is by way of example, not limitation. There are a host of users for tapped transformers with tap switches or other means of changing voltages. Had Winsand desired to limit his claim, it would have been

easy to do so. He failed to so limit it. The implication is obvious that he wanted, naturally, to preserve the broadest scope possible for his claims.

In this connection, Defendants have raised the argument that Winsand is precluded from arguing his invention is limited to resistance welding by file wrapper estoppel. The following facts from the patent's prosecution are relevant. As originally drafted, none of the thirteen claims mentioned resistance welding as a limiting feature. They were initially rejected as indefinite and obvious in light of Krone '080 and Maberry '559. All thirteen claims were then cancelled and Claims 14-24 were inserted. These were rejected as obvious in light of Italian Patent '326. The claims were amended for appeal and then, after consideration, were finally rejected as obvious in light of ultrablitz. On 1/26/66 another amendment was made to insert the phrase "resistance welding" into five of the claims, in order to avoid the prior art reference of ultrablitz and Italian '326. The examiner rejected the amendment as untimely. Later, Winsand petitioned the Commissioner for entry of the amendment. However, before the Commissioner acted, Winsand's lawyer, William Griffith, spoke to the examiner on the telephone. He was told that if he would make an unrelated change in their Claim 14 (Claim 1, as allowed), the patent would issue. Thus, the petition to the Commissioner was withdrawn.

The inference arising from these facts is that after the ultrablitz unit came to light, disclosing a tapped transformer used in junction with two pairs of plugs to which the primary power plug was connected in a piece of camera equipment, Winsand thought it advisable to narrow his claims, a step he had avoided taking in response to earlier rejection. Luckily, as it turned out,

the amendment was untimely, and before it could be entered, Winsand learned the claims would be allowed without it. Seeing that the claims would be allowed in the same broad form as initially drawn, Winsand withdrew from the now unnecessary limitation.

[16] The paradigm case of file wrapper estoppel is a narrowing of a claim to avoid prior art, subsequent allowance of the claim and then an effort by the patentee to claim infringement through application of the doctrine of equivalents. The patentee is not allowed to recapture through equivalents what he surrendered to obtain his patent.

File wrapper estoppel is not limited to cases where the patentee tries to broaden his claim in an infringement suit. It also applies when the patentee tries to narrow his claims to avoid a finding of obviousness. Schriber-Schroth Co. v Cleveland Trust Co., 311 U.S. 211, 47 USPQ 345 (1940); Kaiser Industries Corp. v McLouth Steel Corp., supra, 400 F2d at 52-55, 158 USPQ at 580-583.

The essence of file wrapper estoppel is that the patentee should not take inconsistent positions concerning the same subject matter in different transactions. 4 Walker on Patents § 234 (Deller 2d ed. 1964). Thus, the question is whether Winsand took the position that his invention was not limited to resistance welding in his application. If so, he cannot urge that limitation here. I conclude that he took such a position; he cannot urge the limitation here.

[17] The court noted in Kaiser that it is difficult to show the [*sic*] absence of a limitation implies a broad claim. 400 F2d at 55, n. 17, 158 USPQ at 582-583 n. 17. However, as the court said, if a limitation is abandoned,

then the implication does arise. As to what constitutes an abandonment, the court said "abandonment is established if a phrase used in an abandoned or rejected claim is not used in a later accepted claim." 400 F2d at 55, 158 USPQ at 582-583. It does not matter that the Patent Office never took action on the amended claims, Id., at 54, 158 USPQ at 581-582, therefore, I conclude it does not matter that they were never actually part of the claims before the Patent Office. Viewed in the context of the application as a whole, it is evident that the limitation was inserted as a last resort. When it became apparent it was unnecessary, it was quickly withdrawn. Winsand is estopped to claim his patent is limited to resistance welding. Additionally, the patent would not be so limited without the estoppel.

The second "recurring theme" in this suit is Winsand's attempt to rely on undisclosed advantages of his patent to show the extent to which it is an advance over prior art. The most important example of this is his claim that the rectangular tap terminal arrangement allows the construction of a narrow transformer. This is, perhaps, the most important feature of his patented device; it was its genesis. But there is no mention *at all* of this advantage anywhere in the patent or the file wrapper. Additionally, Winsand claims the transformer is limited to resistance welding, yet nothing in the specification relates to the sturdy construction, clearance spaces or insulating materials necessary to make a transformer a resistance welding transformer. I conclude that Winsand cannot rely on these undisclosed advantages to sustain the validity of his patent.

[18] In American Seating Co. v National Seating Co., supra, the court faced a similar problem with respect to a bus seat base alleged to improve the crashworthiness of

the seat itself. The court refused to consider this function in its claim to a synergistic effect because "[t]his function [was] completely omitted in the patent's specifications. No argument as to improved crashworthiness was raised before the patent office." Citing Graham, the court noted that "[i]f this were so vital an element in the functioning of the apparatus, it is strange that all mention of it was omitted." Although the undisclosed advantages of Winsand are probably not the result of an after-thought by an astute patent lawyer, as the court seemed to feel was the case in American Seating, there are certainly indications that the advantages were deliberately omitted from the patent. This seems to present an equally strong reason for refusing to give effect to those features. As stated in Robintech, Inc. v Chemidus Wavin, Lts., 198 USPQ 466 (D.D.C. 1978) "advantages must be recited in the claims [if they are to be relied upon] for the purpose of establishing patentability. Inherent attributes which are not in the claims may not be relied upon by the patentee to distinguish the claims of the patent over the prior art."

With these two fundamental questions behind me, the analysis of the differences between Winsand and the most pertinent prior art may proceed.

Each of the nine significant elements of Claim 1 is met by Bauer. The only difference is that Bauer converts several input voltages into a single output, whereas Winsand does the opposite. There would be differences between the German Bauer patent, designed for cinema equipment, and a version of Winsand designed for resistance welding. However, the differences would be as to size, materials, and most important, turn ratios. The Winsand device is a construction of Bauer with the appropriate turn ratios to transform 440 volt input

current into output currents on the order of 3 to 7 volts, whereas Bauer transforms currents between 110 and 220 volts into a constant output. But, note, the differences exist as to features of Winsand that are not mentioned in the patent. Precisely the same analysis applies to Claim 2. In fact, the similarity is even more pronounced because both patents disclose a circular array of tap terminals around a common central tap terminal. The similarity between Winsand and ultrablitz is essentially of the same type as between Winsand and Bauer. Ultrablitz discloses only two pairs of terminals in a linear array as compared to Winsand's circular array, but this is the only difference. The principles of devices like Owen '260 are also applicable. It is possible to substitute a transformer's taps for the plurality of resistance heating circuits disclosed in Owen. If this was done, Owen would perform the Winsand function. The testimony also shows that Cage could be modified in a manner contemplated by the inventor to perform the function of both Claim 1 and Claim 2 of Winsand. Cage explicitly discloses its application to transformer taps.

Claim 4 is, electrically, susceptible of the same analysis set forth above. However, it discloses a housing and a cover plate that encloses the tap terminals. Claim 4 should best be regarded as a combination of Bauer and the housing disclosed by Girton '431. The cover plate which, in Bauer, is designed to ensure the proper tap setting must be either removed and replaced by a Girton-type housing, or modified to obtain the same result. The Cage plug assembly performs a shielding function but would have to be modified to perform the enclosure function disclosed by Winsand. Cage lacks fasteners and a gasket. The ultrablitz does not disclose either a shield or housing function, nor do the other prior art patents not cited by the Patent Office.

Claim 4 differs from Girton 431 in that the primary disconnect plug has been modified to accommodate the tap terminals inside the Girton switch housing. They have been rearranged and stood on end to accommodate the plug, which has been equipped with a larger version of the cover plate behind Girton's plug. From a functional standpoint, several moving parts in the tap switch have been eliminated and the danger of inadvertent changing of the tap setting is lessened. The results of Girton and Winsand are the same; both transform 440 volt, 150 amp input current into three or more very low voltage, high amperage output currents. The functional integration of the tap switch mechanism and the transformer is a notable similarity between Girton and Winsand not disclosed by ultrablitz, Cage or the Owen-type heating circuit multiple connectors. Both Girton and Winsand disclose their application to resistance welding, though Girton is limited thereto, whereas Winsand is not.

Claims 3 and 5 of Winsand are essentially rearrangements of the tap terminals of Claims 2 and 4 into a rectangle: the center tap terminal has been split into two which are shorted together and the terminals on the periphery of the circle have been moved so that they form two pairs above and below the split center terminal. This rectangular array is not disclosed by any prior art reference, though Cage shows both a circular and rectangular array of tap terminals in a repositionable plug. Claim 5's requirement of a housing calls into play the same reliance on Girton '431 as Claim 4 did.

C. The Level of Ordinary Skill in the Art

The direct evidence as to the level of ordinary skill in either the electrical connector field or the resistance welding design field is not as complete as it is with

respect to the other two Graham inquiries. The testimony as to the obviousness of Winsand to one skilled in the "electrical arts" implies a level of skill therein that would have perceived Winsand as obvious in 1961. TT pp. 430-431. However, it is advisable to be more specific. To this end I make the following findings:

[19] Electrically. Winsand is simple. I take judicial notice of the fact that the principles it uses are elemental, being taught in any high school physics text. The level of skill required to understand Winsand, Cage, Bauer, et al, is well within the range of skills possessed by those in the voltage transformation field and the "resistance welding" field. As to the skills present in the pertinent field, an ordinarily skilled person would be an engineer, either electrical, as are Winsand and Dilay, or mechanical, as are McDougal and Beaman. His knowledge would enable him to interpret schematic drawings using the symbols commonly used therein.[8] He would know the insulating and conductive properties of various substances. He would be able to depict his understanding of electrical devices schematically. He would posses an understanding of the application of connectors and switches to fields other than the one in which the device appeared. See, e.g. TT 552 (Dilay); TT 428 (McDougal); Winsand Deposition at 94. He would know how schematics are reduced to physical form. See, e.g. TT 531. This is not to say that the knowledge of one in the electrical connector or resistance welding fields would be limited to these skills. However, these basic skills he would possess, and these are the skills necesary to understand and apply the devices involved in this

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[8] Plaintiff's cross-examination of McDougal on this point notwithstanding. See TT 456-474.

lawsuit. Because Winsand is not complex, it is not difficult to find the defendants had sustained their burden of proof in this regard. See, e.g., Cloud v Standard Packaging Corp., 376 F2d 384, 391. 153 USPQ 317, 322-323 (7th Cir. 1967); Rockwell v Midland-Ross Corp., 438 F2d 645; 651-652, 169 USPQ 5, 9-11 (7th Cir 1971); Universal Athletic Sales Co. v American Gym., etc., 546 F2d 530, 542-543, 192 USPQ 193, 201-203 (3d Cir 1976) cert. denied 430 U.S. 984, 197 USPQ 783 (1977); compare, Saginaw Products Corp. v Eastern Airlines, Inc., 195 USPQ 551, 558, 562 (E.D. Mich 1977).

IV. Obviousness

[20] The inquiry in this regard may be accomplished by picturing a hypothetical person of ordinary skill in the electrical arts, or, more specifically, the voltage transformation art, at work in a room with the best of the prior art references arrayed about him: Bauer, Cage, Girton and ultrablitz. See, e.g. In re Winslow, 365 F2d. 1017, 151 USPQ 48 (C.C.P.A. 1966). The inventor is next confronted with Winsand and asked: "Can you reverse Bauer to obtain one output from several inputs," for Claims 1 and 2; "Can you add a Girton-type housing" to obtain Claim 4; "Can you rearrange the tap terminals into a rectangle" to obtain Claim 3 and, "Can you add to that a Girton-housing" to obtain Claim 5. If his answer to all of these is an unqualified "yes," the solution occurring ordinarily and naturally from the prior art, then the purported invention is obvious, provided, of course, that the inventor is one possessing the ordinarily high level of skill found in the pertinent field. I concluded Winsand's combination of Girton and Bauer to obtain Claim 4, the rearrangement of 4 to obtain Claim

5, and the straightforward adaptation to a reverse use to obtain claims 1, 2 and 3 are obvious. The reversal of function is obvious, the rearrangement of terminals is obvious and the addition of the Girton housing is obvious. None require any invention.

[21] In arriving at this conclusion, I have reviewed Claims 4 and 5 as "combination patents." As such, they are subject to a very strict scrutiny. Great Atlantic & Pacific Tea Co. v Super-Market Equipment Corp., 340 U.S. 147, 87 USPQ 303 (1950). The test for such patents is that they must produce a synergistic result; they must somehow exceed the sum of their parts. A new or surprising result must be present. Anderson's Black-Rock, Inc. v Pavement Salvage Co., Inc., 396 U.S. 57, 163 USPQ 673 (1969); Sakraida v Ag Pro, Inc., 425 U.S. 273, 189 USPQ 449 (1976); Shatterproof Glass Corp. v Guardian Glass Co. 462 F2d 1115, 1123, 174 USPQ 374, 379 (6th Cir) cert. denied 409 U.S. 1039, 176 USPQ 33 (1972); Bontrager v Steury Corp., 457 F Supp 526, 535, 201 USPQ 813, 820 (N.D. Ind. 1978). The Winsand device functions just as expected. It produces no new result.

V. Secondary Considerations

[22] Plaintiff's proofs to the effect that Winsand has been successful stand unrefuted. Ford has adopted as its standard a device virtually identical to Winsand, after previously using Winsand itself for some time. Fisher Body also accepted the device. However, this cannot save a patent from invalidity when there is a lack of invention. Graham, supra, 383 U.S. at 35-36, 148 USPQ at 473-474; American Seating Co. v National Seating Co., 586 F2d 611, 622, 199 USPQ 257, 264-265 (6th Cir 1978).

As to the "long felt need" to which Plaintiff adverts, I find that if there was a need, it was not particularly acute. Why else, for example, would Kirkhof, which conceived the germ of the idea in late 1960, have allowed the idea to languish for a year and a half? Kirkhof was the world's largest manufacturer or resistance welding equipment. It presumably had thorough knowledge of its market.[9]

Furthermore, resistance welding is mostly used in the auto industry; the needs of the automakers are basically the needs of the resistance welding field. The need for a *narrow* transformer did not manifest itself until Klingelhofer and Sarafian made it known. They did this twice, to Winsand at Dollar and to Emaus at Kirkhof. In each case, a device meeting the need was made within a short time. See e.g., Felburn v New York Central Railroad Co., 350 F2d 416, 425-26, 146 USPQ 622, 629-630 (6th Cir 1965) cert. denied 383 U.S. 935, 148 USPQ 771 (1966).

I note also the patent's difficult progress through the Patent Office. On two occasions the examiner rejected Winsand's claims on the basis of obviousness.

[23] Plaintiff also asserts that Defendants paid the supreme compliment to the patent in suit by copying it. However, nothing prevents copying an unpatentable device. Janex Corp. v Bradley Time, 460 F Supp 383,

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[9] Moreover, there is some evidence, at least, that the device did not fill any need at all. Roth testified that the Winsand type device he designed, the X device, was no better than the Girton transformers then on the market. Roth Deposition at 50. There might also have been problems with the rectangular Winsand device's ability to be plugged in to reverse polarity and short the transformer.

389, n. 10, 199 USPQ 525, 530-531, n.10 (S.D. N.Y. 1978). In sum, the patent in suit simply lacks the "impalpable something" that constitutes invention. Dickstein v Seventy Corp., 522 F2d 1294, 1299, 187 USPQ 138, 142 (6th Cir 1975), cert denied, 423 U.S. 1055, 188 USPQ 224 (1976).

What Winsand contributed is a practical version of the combination of the tap switch and the primary plug. He made commercially practicable in the resistance welding field an obvious combination (of Bauer and Girton) or adaptation (of Bauer).

[24] It is true Winsand perceived a demand in the market. Perception of need is the first step in the inventive process. Warren Telechron Co. v Waltham Watch Co., 91 F2d 472, 473, 34 USPQ 135, 137-138 (1st Cir 1937). Kirkhof perhaps failed to see the potential market. However, this is not enough. It must be followed by a nonobvious solution. Solex Laboratories v Graham, 165 F Supp 428, 118 USPQ 438 (S.D. Cal. 1958).

Plaintiff has failed to contribute anything new. To uphold his patent would be to remove the teachings of Bauer and Girton '431 from the public. The patented device is a good idea. But as the Supreme Court said in Sakraida:

> Though doubtless a matter of great convenience, producing a desired result in a cheaper and faster way, and enjoying commercial succes, [a combination patent is invalid if it does not] produce a "new or different function" . . . within the test of validity of combination patents.

VI. Infringement

[] The United States Court of Appeals for the Sixth Circuit has expressed its desire for a finding on infringement even though the patent has been held invalid. Noll v O. M. Scott & Sons, 467 F2d 295, 297 n. 1, 175 USPQ 392, 394-395 n.1 (6th Cir) cert. denied 411 U.S. 965, 177 USPQ 545 (1967). I find that the accused transformer infringes Claims 4 and 5 of the Winsand patent. See Graver Tank Co. v Linde Air Products Co., 339 U.S. 605, 608, 85 USPQ 328, 330 (1950); Maxon v Maxon Construction Company, 395 F2d 330, 158 USPQ 77 (6th Cir 1968); Schimizzi v Chrysler Corp., 462 F Supp 630, 634, 202 USPQ 180, 183-184 (S.D. N.Y. 1978); Strahle v Dillard's Dept. Stores, 459 F Supp 396, 398, 203 USPQ 503, 505 (W.D. Tex. 1978).

VII. Costs and Attorney's Fees

Section 285 of Title 35 provides:

> The court in exceptional cases may award reasonable attorney fees to the prevailing party.

[26] Defendants argue Plaintiff has persisted in this lawsuit only to harass them and that Plaintiff's conduct has been characterized by stubborness and bad faith. Defendants point to the manner in which Plaintiff has shifted his theory in this case and urge me to infer that Plaintiff has thereby conceded the invalidity of his claims. I conclude that the Defendants' argument in this respect is devoid of merit. Although this was not a particularly close case, Plaintiff's positions were based on a colorable interpretation of applicable law. The

Plaintiff was "honestly mistaken as to a reasonably debatable question . . ." Enterprise Mfg Co. v Shakespeare Co., 141 F2d 916, 921, 61 USPQ 201, 205-206 (6th Cir 1944), quoted in Elton Corp. v Basic Incorporated, 599 F2d 745 (6th Cir 1979); Campbell v Campbell Machines Co., F2d (slip opinion at pp. 8-12, June 27, 1979). I find no evidence of the conduct necessary to support an award of fees and costs.

An appropriate order may be submitted.

[Appendices omitted]

APPENDIX B

OPINION

Nos. 80-1100, 80-1130

(United States Court of Appeals
for the Sixth Circuit)

(Decided and Filed February 12, 1982)

(Dollar Electric Company, Plaintiff-Appellant, and Cross-Appellee v. Syndevco, Inc., and Ford Motor Company, Defendants-Appellees, and Cross-Appellants.)

Before: Weick* and Engel, Circuit Judges and Peck, Senior Circuit Judge.

Weick, Circuit Judge, delivered the opinion of the Court, in which Peck, Senior Circuit Judge, joined. Engel, Circuit Judge, (p. 9) filed a separate concurring opinion.

Weick, Circuit Judge. The suit in the district court was brought by Dollar Electric Company (Dollar) against Syndevco, Inc. and Ford Motor Company for infringement of Winsand U. S. Patent No. 3,281,747(747), issued on October 25, 1966 and assigned to Dollar. The patent in suit is for a device which changes the output voltages from a transformer useful in this case by automobile manufacturers in the field of resistance welding.

The case was tried in an extensive bench trial, a jury being waived, before District Judge Feikens. The Judge

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* Judge Weick became a Senior Circuit Judge on December 31, 1981.

gave careful consideration to all of the issues and wrote a 61 page opinion, in which he analyzed all of the issues, adopted findings of fact and conclusions of law, and appended thereto the five claims of the patent in suit and the drawings. Joint Appendix pages 22-83. Drawings, a, b and c. Judge Feikens held that all of the claims of the patent in suit were invalid. He further held that if claims 4 and 5 had been valid, that they were infringed by the accused device. Claim 1 he found to be essence of the invention and that the remaining claims contained additional elements that were either obvious or were anticipated by the prior art. Dollar has appealed only in No. 80-1100 from the judgment holding claims 4 and 5 of its patent invalid. It is noteworthy that since Dollar did not appeal from the judgment of the district court holding that Claims 1, 2 and 3 to be invalid, that part of the judgment has now become final and is the law of the case. Only claims 4 and 5 are in issue in this appeal. Defendants-Appellees have cross-appealed from that part of the judgment relating to infringement. For the reasons hereinafter stated, we affirm the judgment in No. 80-1100, and, since the patent is invalid, it is not necessary to decide the issue of infringement and the protective cross appeal taken in No. 80-1130 is therefore dismissed at defendants-cross-appellants' costs.

I

Dollar manufactures electrical resistance welding machines for use in mass production assembly lines. Such machines are used primarily by automobile manufacturing companies. Electrical transformers are a component in these machines. Defendant Syndevco, Inc. (Syndevco) manufactures receptacle and plus components for these transformers. Dollar and Syndevco

are both suppliers of defendant Ford Motor Co. (Ford), which purchases resistance welding equipment from Dollar, Syndevco, and others for use in its manufacturing plants.

Resistance welding consists of clamping two pieces of metal together and welding them by passing an electric current through them. The transformer controls the voltage which is applied. It is necessary to provide some means to adjust the output voltage of the transformer to accommodate thicknesses or different materials of the parts that are to be welded together. This is done by means of tap switches. During the 1950's and 60's the standard technology was to use rotary tap switches, as in prior patents Girton '431 design and Woofter '654.

A tap switch is a switch that connects an electrical power supply to any one or two or more taps. A tap is a branch connection to an electrical coil. A plug tap switch is a power supply for making an electrical connection to any one of several pairs of tap terminals. A transformer is an electrical device that is used to change the voltage of an alternating electrical current power supply to a higher or lower voltage.

In early 1962, Fisher Body requested Dollar to design a narrow transformer 4½ inches wide. This was several inches narrower than the normal transformer at that time. Dollar's employee, Mr. Winsand, began work on this project in April 1962. He could not make the transformer small enough using currently available tap switches. He then thought of combining the functions of the primary disconnect plug and tap switch. This eliminated all moving parts of the tap switch of the Girton '431 transformer and permitted a successful design in the required size. The new transformers were

built and tested by July 9, 1962 and later patented. They were placed in service at Fisher Body's Marion, Indiana plant.

Winsand made two versions of his invention, a circular version and a rectangular or "in-line" version. The Winsand invention had several advantages over previous technology: It was more compact and supplied a lesser need for a more reliable, inexpensive construction for the tap switch.

When the Winsand transformer proved successful at Fisher Body, Ford began using the transformers at its Metal Stamping Division, under the supervision of Mr. John Murphy. After ten years of using Dollar's transformers, Mr. Murphy designed a similar transformer in which the tap terminals are housed in a plastic end cover for the transformer. This is the accused transformer. Syndevco does not manufacture complete transformers, so Ford purchased Girton '431 transformers and supplied them to Syndevco. Syndevco then cannibalized the Girtons and fitted them with the end cover and primary disconnect plug of the accused transformers. After four years of debugging, the Murphy transformer was adopted as the standard for the Metal Stamping Division of Ford.

II

Claim 4

The district judge held that "Claim 1 sets forth the essence of the invention." We agree. He listed the nine basic elements of the claim as follows:

(1) A transformer having a primary and a secondary

(2) A plurality of taps connected at spaced points to the primary

(3) The taps are connected to tap terminals, which are insulated from one another

(4) A primary disconnect plug with a pair of spaced female terminal receptacles connected to a voltage source

(5) The tap terminals are arranged so that there are two or more pairs created, the pairs being spaced apart the same distance as the plug receptacles

(6) Neither terminal of the first pair of terminals is a member of another pair

(7) A plug that can be connected to energize the primary by fitting into removable contact with the terminals

(8) The pairs of tap terminals are spaced so that the plug can bridge various pairs of them

(9) The primary disconnect plug functions as a tap switch

He describes the ramaining claims as follows:

Claims 2 and 4 more specifically describe a circular version of the Claim 1 device, without specifically referring to Claim 1. In Claim 2, it is specified that the pairs of tap terminals called for by (5) above be achieved by placing one common tap terminal in the center of a circular array of other tap terminals. Thus, by rotating a plug around the center tap, various pairs are produced, with various corresponding output voltages. This, of course, does not meet the requirement (6) in Claim 1 that "neither terminal of said first pair of terminals is a member of another pair"; the center tap terminal is common to every pair.

Claim 4 essentially repeats Claim 2 but recites the addition of a housing surrounding the tap terminals, with an opening through which the primary plug passes. The plug is fitted with a cover plate which, after the plug is engaged, may be fastened to the housing, totally enclosing the terminal assembly. Claim 4 is represented pictorially by PTX 19, Appendix "B." (The labels are mine)

Claim 3 is simply another arrangement of the tap terminals. There are six terminals, arranged in three horizontal rows of two each. The top and bottom rows are individual tap terminals, connected at varying points electrically to the primary coil. The two middle terminals are shorted together and are both connected to the opposite end of the primary from the four taps already described. By positioning the plug across the four pairs of terminals formed by the top and bottom rows, four output voltages may be obtained.

Claim 5 recites Claim 3 with the addition of a housing surrounding the terminals and a cover plate behind the plug. With the addition of a gasket, the cover plate completely seals the terminal and plug construction from the outside.

Claim 4 of the patent in suit is based upon invalid Claim 2 with the additional element of a housing that encloses the primary and secondary windings and the primary tap terminals with an opening through which the plug may be inserted to engage a selected pair of tap terminals. It specifies a plate secured to the plug to cover the portion of the opening that is not covered by the plug when it is inserted into the opening. Both claims 2 and 4 are restricted to the circular arrangement of the tap terminals illustrated in the patent drawings.

Judge Feikens held that Claim 2 was fully anticipated by the German patent to Bauer, No. 1,303,494 or its Italian counterpart, No. 315,072. Since Dollar did not appeal from this holding, it has become final and is binding on this court as the law of this case. Judge Feikens further held that Claim 4 was an obvious adaption of the Bauer plug tap switch.

To specify a housing to enclose the equipment did not amount to invention as it was old as the art. *American Seating Co. v. National Seating Co.*, 586 F.2d 611 (6th Cir. 1978).

The district judge further held that Claim 4 was invalid as an obvious combination of Bauer '494 and Girton '431 within the meaning of 38 U.S.C. § 103. We agree.

Dollar objected to the court's use of Girton '431 as prior art on the ground that it was not cited by the defendants as required by 35 U.S.C. § 282. In fact, it was not cited to the patent office and the patent was issued without the citation of any relevant prior art. Dollar also claimed surprise, but the inventor Winsand was not surprised and made no such claim. He testified for Dollar during its prima facie case and on cross-examination stated that the tap switch and transformer disclosed in Girton '431 patent as exemplified by the physical specimen PX15A was the closest prior art of which he was aware when he made his invention. Girton patent was introduced in evidence by Dollar and is marked PX10.

The court therefore was fully justified in considering the testimony of the inventor and applying it to the case. The fact that the patent office did not consider the applicable prior art which clearly existed as shown by the testimony of the inventor, greatly weakens and largely dissipates the statutory presumption of validity of

the patent under 35 U.S.C. § 282. *Dunlop v. Kelsey-Hayes Co.*, 484 F.2d 407, 413 (6th Cir. 1973); *B. F. Goodrich Co. v. Rubber Latex Products, Inc.*, 400 F.2d 401 (6th Cir. 1968). Claim 4 is therefore invalid.

III

Claim 5

Claim 5 of the Winsand patent is based on invalid Claim 3 with the recitation of an additional element of features of a housing that encloses the primary and secondary windings and the tap terminals. It also specifies an opening in the housing exposing the tap terminals and a rectangular plate secured to the plug for covering the opening when the plug is inserted through the opening and into the housing. Claims 3 and 5 are restricted to the straight line arrangement of the tap terminal shown in Figs. 5-8 of the drawings of the Winsand patent. As found by the district court, this was an obvious rearrangement of the circular arrangement of the Winsand patent and was disclosed in the German patent to Bauer.

The patent examiner in rejecting Winsand's claims stated:

> Whether the terminals of a disconnect plug and or the tap terminals are arranged in a straight line or in a circular is without patentable merit.

Dollar's expert witness Townsend Beaman testified that he regarded them as equivalents. In other words, it was obvious.

The arrangement of three tap terminals in a straight line so that the plug can engage the middle terminal and either of the other two is disclosed in the parior [*sic*] patent to McArdle '200.

What has been said in discussing Claim 4 is equally applicable to Claim 5 and the district court's ruling as to

Claim 4 requires a holding that Claim 5 is also invalid and we so hold.

IV

In our opinion, the findings of fact adopted by the district court are supported by substantial evidence and its conclusions of law are correct. The court did not abuse its discretion in disallowing attorneys' fees.

The judgment of the district court is affirmed. Each party will pay its own costs in Appeal No. 80-1100.

Engel, Circuit Judge, concurring. I concur because I agree that the district court's findings that Claims 4 and 5 are invalid as an obvious combination of Bauer '494 and Girton '431 within the meaning of 35 U.S.C. § 103 are not clearly erroneous. I would avoid the suggestion in the majority decision that the trial judge's rejection of Claim 2, not appealed from here, is the "law of the case" and for this reason commands a similar result for Claim 4. U.S.C. § 282 cautions:

> A patent shall be presumed valid. *Each claim of a patent (whether in independent, dependent, or multiple dependent form) shall be presumed valid independently of the validity of other claims; dependent or multiple dependent claims shall be presumed valid even though dependent upon an invalid claim..*

(emphasis added). The legislative history of this section seems to indicate that a "law of the case" approach in circumstances such as this is not favored. S. Rep. No. 301, 89th Cong., 1st Sess. *reprinted in* [1965] U.S. Code & Cong. Ad. News 2315, 2319.

I agree that Judge Feikens' use of Girton '431 was proper. It came as no surprise at trial, and appears to be expressly permissible under 35 U.S.C. § 282 "on such terms as the court requires." *Shatterproof Glass Corp. v. Guardian Glass Co.*, 462 F.2d 1115, 1121 (6th Cir.), *cert. denied* 409 U.S. 1039 (1972).

APPENDIX C

ORDER

Nos. 80-1100, 80-1130

(United States Court of Appeals
for the Sixth Circuit)

(Filed Apr. 20, 1982)

(Dollar Electric Company, Plaintiff-Appellant and Cross-Appellee v. Syndevco, Inc., and Ford Motor Company, Defendants-Appellees and Cross-Appellants)

Before Engel, Circuit Judge, Weick and Feck, Senior Circuit Judges.

A majority of the active circuit judges of this court not having voted in favor of en banc consideration of the petition for rehearing, said petition for rehearing was referred to the panel for consideration and disposition.

Upon consideration of the petition for rehearing, we are of the opinion that the issues of this appeal have been adequately treated by the panel and that the petition for rehearing lacks merit.

It is therefore ordered that the petition for rehearing be and it is hereby denied.

ENTERED BY ORDER OF THE COURT

/s/ John P. Hehman
Clerk

APPENDIX D

Figures 6, 7 and 8 of Winsand U.S. Patent No. 3,281,747

Oct. 25, 1966 A. O. WINSAND 3,281,747
MULTI-TAP PLUG
604
Filed Feb. 25, 1963 4 Sheets-Sheet 4

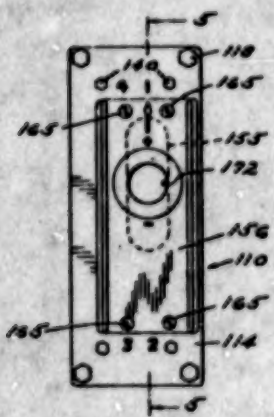


FIG. 6

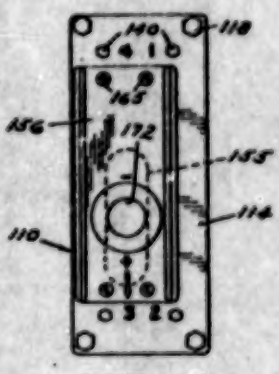


FIG. 7

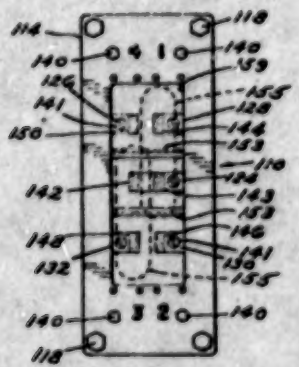


FIG. 8

INVENTOR.
AMOS O. WINSAND
BY
ATTORNEYS

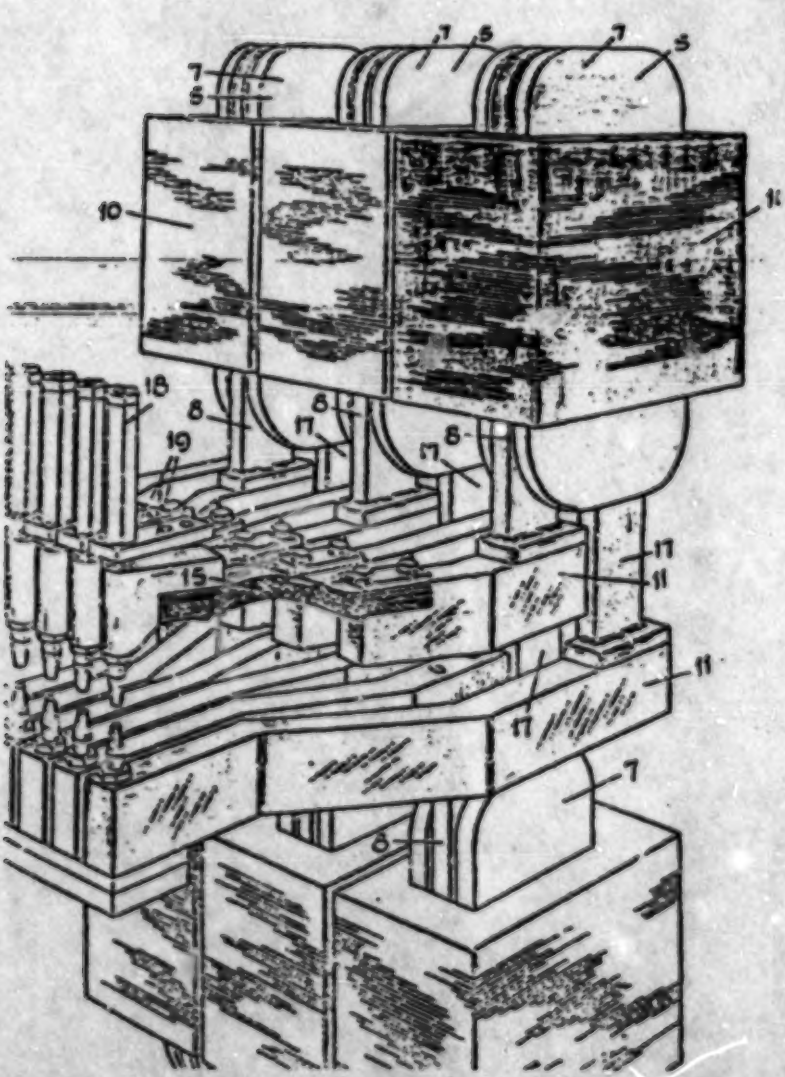
APPENDIX E

Figure 1 of Martin U.S. Patent No. 2,242,867

', 1941. W. H. MARTIN 2,242,867

WELDING MACHINE

Filed Feb. 24, 1940 3 Sheets-Sheet 1



APPENDIX F

Figures 3, 4 and 5 of Girton U.S. Patent 3,024,431

March 6, 1962 P. E. GIRTON 3,024,431

WATER COOLED WELDING TRANSFORMER

Filed Sept. 23, 1957 2 Sheets-Sheet 2

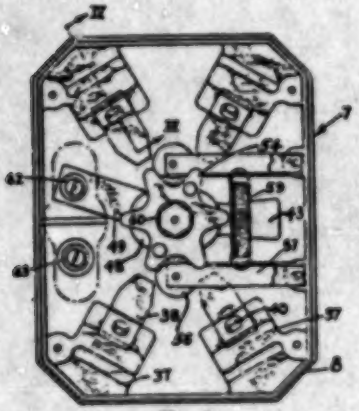


Fig. 3

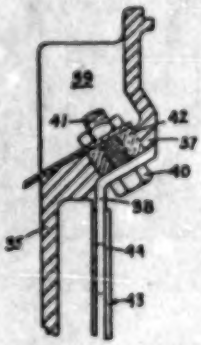


Fig. 4

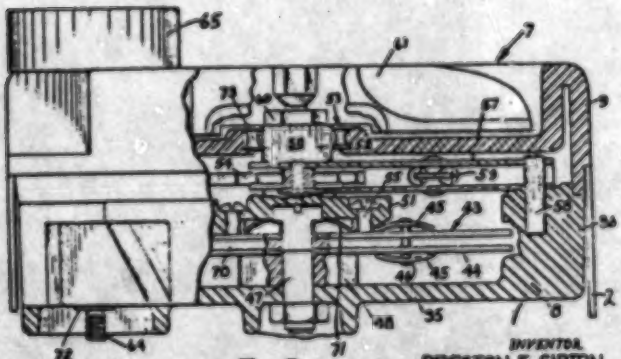


Fig. 5

INVENTOR.
PRESTON E. GIRTON
BY
Richard Hemmelel
ATTORNEYS

APPENDIX G

Figures 12, 13 and 14 of Taylor, et al U.S. Patent No. 2,929,915

636

March 22, 1960 R. M. TAYLOR ET AL 2,929,915

WELDING TRANSFORMER APPARATUS

Filed March 31, 1958 4 Sheets-Sheet 4

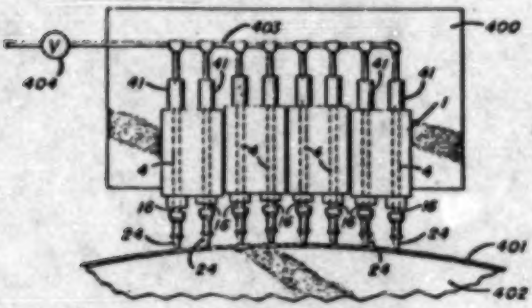


Fig. 12

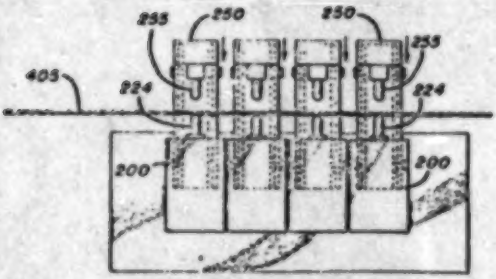


Fig. 13

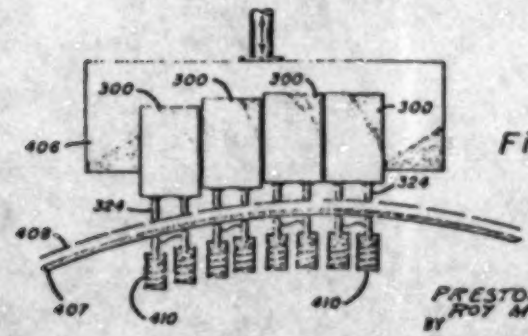


Fig. 14

INVENTOR.
PRESTON E. GIRTON
ROY M. TAYLOR
BY
ATTORNEYS

APPENDIX H

Figures 1, 2, 3, 6 B, and 11 of Cage U.S. Patent No. 3,139,942

June 30, 1964 A. G. CAGE, JR 3,139,492
REPOSITIONABLE CONNECTOR PLUG WITH POSITION ELIMINATOR MEANS
Filed Jan. 11, 1961 3 Sheets-Sheet 1

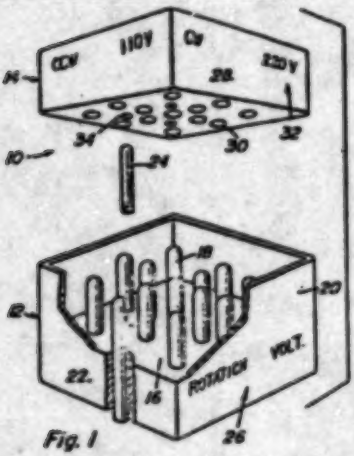


Fig. 1

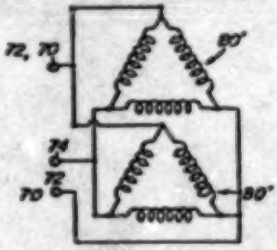


Fig. 11

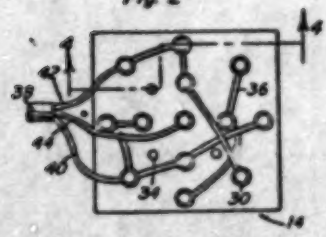


Fig. 2

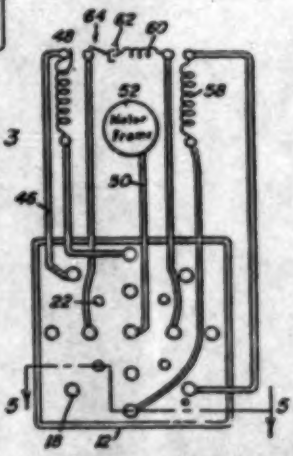


Fig. 3

Fig. 6 B

Albert G. Cage Jr.
INVENTOR.
By [signature]

APPENDIX I

Figures 1 through 5 of Bauer German Utility Model Patent No. 1,303,494

BAUER GERMAN UTILITY MODEL PATENT NO. 1,303,494

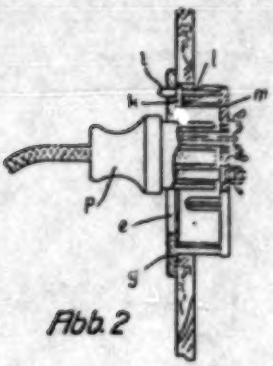


Abb. 2

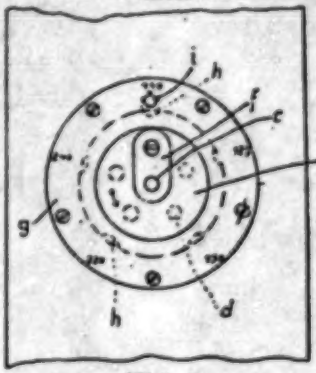


Abb. 3

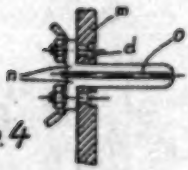
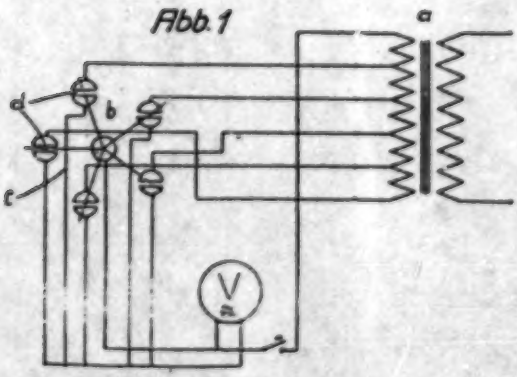


Abb. 4

Abb. 5

Abb. 1



APPENDIX J

Figure 1 of Girton U.S. Reissue Patent No. 24,838

219/116

SEARCH ROOM

618

June 14, 1960 P. E. GIRTON Re. 24,838

PRIMARY DISCONNECT PLUG FOR WELDING TRANSFORMERS

Original Filed Aug. 13, 1952 3 Sheets-Sheet 1

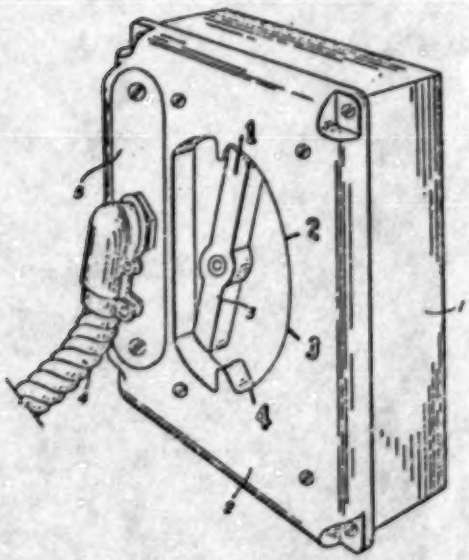


Fig. 1

INVENTOR.
Preston E. Girton
BY
ATTORNEYS

Plaintiff's
Trial
Exhibit 9